

2014-2015

LAND RECLAMATION

PROGRAM

BIENNIAL REPORT



Cover: Hume #1 mine, Continental Coal Inc., during and after reclamation.

Table of Contents

Introduction and Missouri Mining Commission List

Land Reclamation Program and Administration

- 2 Introduction
- 3 Organization
- 3 2014-2015 Program Highlights

Coal Mining

- 6 Introduction and Purpose
- 7 Permitting
- 7 Bond Releases
- 7 Alternate Fuels Incorporated Permits
- 8 Inspections
- 8 Enforcement
- 9 Bonding
- 9 Bond Forfeiture Reclamation
- 9 Off-Site Impacts

Abandoned Mine Lands

- 10 Activities
- 10 Reclamation Funding
- 10 Reauthorization
- 12 Inventory and Ranking
- 12 Missouri's Abandoned Mine Land Emergency Program
- 12 Abandoned Mine Land Featured Projects

AML Non-Coal Reclamation Projects

- 17 Featured Projects

Industrial Minerals

- 20 Legislative and Rule Changes
- 21 Public Participation
- 22 Permitting
- 22 Inspections
- 22 Types of Inspections
- 23 Regular Inspections
- 24 Concern Inspections
- 24 Bond Release and Other Inspections
- 26 Enforcement
- 26 Bonding
- 27 Bond Forfeiture
- 28 In-Stream Sand and Gravel Mining
- 29 Spotlight on the Ozarks: Sand and Gravel Mining

Metallic Minerals

- 29 Introduction and Purpose
- 31 Permitting
- 32 Waste Management Act
- 32 Inspections
- 33 Enforcement
- 33 Bonding

INTRODUCTION

Mining activity in Missouri began as early as the 1740s, for mineral commodities such as lead, iron, limestone, sand and gravel. Coal mining, however, began in Missouri in the 1840s. With no legislation or regulation of these operations, there were as many as 67,000 acres left unreclaimed by coal-mining operations. An estimated 40,000 acres were left abandoned from the mining of other commodities. Missouri was left with a legacy of acid-mine drainage, dangerous highwalls, toxic mine spoils, dangerous mine shaft openings, unvegetated and barren soils, soil erosion and stream sedimentation.

The Missouri Department of Natural Resources' Land Reclamation Program was established in 1974 to regulate present mining operations and to reduce or eliminate the issues caused by coal mining operations prior to when laws regulating such operations were enacted. The Land Reclamation Program works to ensure that today's mining industry remains in compliance with Missouri Law Chapter 444 (Rights and Duties of Miners and Mine Owners). The law includes several chapters that are enforced by separate units within the Land Reclamation Program. The Industrial and Metallic Minerals Mining Unit is responsible for sections "The Metallic Minerals Waste Management Act," RSMo. Chapter 444.350-444.380 and "The Land Reclamation Act," RSMo. Chapter 444.760-444.790. The Projects and Inspection Unit and the Abandoned Mine Land and Permit Unit are responsible for "The Surface Coal Mining Law," RSMo Chapter 444.800-444.970.

The state regulations further define these laws. Citizens can find these laws in their entirety in "Rules of Department of Natural Resources Division 40 – Land Reclamation Commission" Chapters 1 -10 for coal and industrial minerals. Metallic Minerals regulations are found in "Rules of Department of Natural Resources Division 45 – Metallic Minerals Waste Management" Chapters 1-8.

The ultimate responsibility of the program is to ensure mine sites in Missouri are returned to a suitable land use and the adverse effects from active mining operations are minimized. When properly reclaimed, these areas can once again be used as farm lands or wildlife areas. Wildlife habitat remains a primary concern of the Land Reclamation Program. Whenever possible, abandoned mines are reclaimed with wetlands, native prairie grasses and trees that are part of Missouri's history. In no way does declining coal production decrease the responsibilities of the Land Reclamation Program.

Monthly inspections of each mine continue to be performed long after the last ton of coal is removed. Revisions to permits and reclamation changes continue to be submitted for review and approval, as operators fine-tune their post-mining land use plans. Bond release requests increase in number and in size as more ground is reclaimed to acceptable standards. In effect, reclamation activities consume a far larger percentage of time and effort than the actual mining of coal itself.

This biennial report provides information and statistical summaries concerning the activities and business accomplishments of the Land Reclamation Program and its efforts to reclaim mined land during the calendar years of 2014 and 2015.

Some information is summarized per state fiscal year 2014 and 2015 to match other reports generated by Land Reclamation Program staff.

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Kevin Mohammadi, Staff Director
Land Reclamation Program

MISSOURI MINING COMMISSION

Public Members

Dr. Gregory Haddock, Chairman
Acting Dean of the Melvin D. and
Valorie G. Booth College of
Business and Professional Studies,
Vice Provost and Dean of the Graduate School
Northwest Missouri State University

Mike Larsen, RG, Vice Chairman

Dr. Leslie Gertsch, Ph.D
Associate Professor of Geological Engineering
Missouri University of Science & Technology

Statutory Members

Robert Ziehmer, Director
Missouri Department of Conservation

Joe Gillman, State Geologist, Director
Missouri Geological Survey
Missouri Department of Natural Resources

John Madras, Director
Clean Water Commission

For more information,
contact the department's
Land Reclamation Program at
800-361-4827 or 573-751-4041
or

dnr.mo.gov/geology/lrp/mineralsandmining.htm



LAND RECLAMATION PROGRAM AND ADMINISTRATION

Organization

The Land Reclamation Program was originally established in the Omnibus State Reorganization Act of 1974. This act created the Missouri Department of Natural Resources and placed the Land Reclamation Commission (created by Missouri Statutes Chapter 444) under its auspices. The Land Reclamation Commission, underwent a name change in 2014 to the Missouri Mining Commission which has the responsibility of directing staff and operations of the program within the Department's Missouri Geological Survey.

The 8-member commission includes three statutory members – the state geologist, the director of the Missouri Department of Conservation and the staff director of the Clean Water Commission. The governor, with Senate approval selects five public members. Of these five, three may be of the same political party. Two members of the commission may have a direct link with the mining industry with one member having surface mining experience and the other having subsurface mining experience.

The Land Reclamation Program consist of Administrative, Abandoned Mines Land and Permit Unit; Project and Inspection Unit; and Industrial and Metallic Mineral Mining Units. Together they are responsible for reclaiming abandoned mine lands, permitting and conducting inspections at all active mining operations in Missouri.

2014 and 2015 Highlights

At the start of fiscal year 2014, Missouri had 3,750 acres for both permitted and bond forfeiture sites. By the end of fiscal year 2015, there are 3,629 acres permitted and bonded with no remaining bond forfeiture acres. The Commission released from reclamation responsibility 340 acres under nine permits that were under bond forfeiture and all funds remaining in the bond pool were expended thus releasing the one remaining site of 60 acres. The Hume West permit was issued for 168 acres and subsequently one expansion for that permit was issued later for 111 additional acres. The demand for high sulfur coal in Missouri has reduced to 296,000 tons as reported in 2014. By the end of fiscal year 2015, with the production of the Lucky Strike mine just across the state line in Kansas, production in Missouri decreased to 168,000 tons. The production amounts are presented as reported by the U.S. Energy Information Administration.

Non-coal

Industrial and Metallic Minerals Mining Unit noteworthy events for 2014 and 2015 are listed below.

The Doe Run Company, West Fork Black River, Gravel Mining Permit

On May 27, 2014, the Land Reclamation Program received a concern about improper in-stream gravel removal activities on the West Fork in Reynolds County. The areas of concern included: no buffer along water or highbank, clearing trees within the landward distance of 25 feet from the high bank, creating several new access roads, pushing material up on the highbank, leaving stockpiled material in the river bottom, and mining into the permanent bank. An inspection was conducted June 5, 2014.

The basis of the complaint was validated. Evidence of improper gravel removal, stream bank destruction, mining outside of mine plan area, and failure to provide adequate buffers along the water's edge and high bank were documented. The Doe Run Company provided verbal assurance that in stream mining would cease until these issues were resolved.

Missouri Department of Conservation stream experts were called in to create a stream restoration plan for the mined out area. Riparian restoration plan was developed to return the site to the original elevation using rock sediment in the bottom layers and soil in the upper layer. The upper soil layer was designed to be a similar depth found on the remaining islands of sediment that were left in this area because of existing trees. The area was revegetated with native trees after the elevation was returned to previous levels. At the upstream end of this area the ground elevation was sloped no steeper than a 4:1 down from the floodplain level to the top of the stream bank along the upstream end. Willow cuttings and stakes were planted along this area of the stream bank. Along the gravel bar side of the riparian area where elevation was returned to previous levels, the elevation of the gravel bar was filled in to create a 4:1 slope from the floodplain/ riparian elevation down to the elevation of the gravel bar. Several isolated mounds of gravel with trees on top were left on the gravel bar. Some of the remaining trees had some gravel filled in around them as the slope away from the riparian area was established. The remaining isolated mounds of gravel with trees were left in the current condition.



West Fork Black River prior to stream bank stabilization plan.



West Fork Black River after Stream Restoration Plan.



Fee Increase for Industrial Minerals

In 2014, "The Land Reclamation Act" was amended at 444.768.1: "Notwithstanding any statutory fee amounts or maximums to the contrary, the Director of the Department of Natural Resources may conduct a comprehensive review and propose changes to the fee, bond, or assessment structure as set forth in this chapter. The comprehensive review shall include stakeholder meetings in order to solicit stakeholder input from regulated entities and any other interested parties. Upon completion of the comprehensive review, the department shall submit a proposed fee, bond, or assessment structure with stakeholder agreement to the Missouri mining commission. The commission shall review such recommendations at a forthcoming regular or special meeting, but shall not vote on the proposed structure until a subsequent meeting. If the commission approves, by vote of two-thirds majority, the fee, bond, or assessment structure recommendations, the commission shall authorize the department to file a notice of proposed rulemaking containing the recommended structure, and after considering public comments may authorize the department to file the final order of rulemaking for such rule with the joint committee on administrative rules pursuant to sections 536.021 and 536.024 no later than December first of the same year. If such rules are not disapproved by the general assembly in the manner set out below, they shall take effect on January first of the following calendar year, at which point the existing fee, bond, or assessment structure shall expire. Any regulation promulgated under this subsection shall be deemed to be beyond the scope and authority provided in this subsection, or detrimental to permit applicants, if the general assembly within the first sixty days of the regular session immediately following the filing of such regulation disapproves the regulation by concurrent resolution. If the general assembly so disapproves any regulation filed under this subsection, the department and the commission shall not implement the proposed fee, bond, or assessment structure and shall continue to use the previous fee, bond, or assessment structure. The authority for the commission to further revise the fee, bond, or assessment structure as provided in this subsection shall expire on August 28, 2024."

Currently, the Industrial Minerals Unit budget is solvent, however, the Industrial Minerals portion of the Mined Land Reclamation Fund has been experiencing increased in costs associated with managing the unit, specifically an increase in costs related to public participation, legal actions and hearings. The last time there was an industrial mineral open pit and in-stream sand and gravel fee increase was during the 2007 legislation session.

The majority of revenue generated for the Industrial Minerals Mining Unit is permit fee based.

In 2014, Land Reclamation Program identified a slight decrease in the budget over the last few years. In 2015, there was a more significant decrease in the budget as a result of full staffing and increased costs associated with hearings. The proposed fee increases will ensure the long-term solvency of the Industrial Minerals Mining Unit.

Approximately 316 operators hold a Land Reclamation Program permit to engage in surface mining. This proposed fee increase would affect about 215 mine operators of both large and small business across the state of Missouri. The remaining operators hold a small operator permit for mining less than 5,000 tons of sand and gravel with a permit fee of \$300 that will not be affected by this proposal.

The purpose of the rulemaking is to increase the fees for industrial mineral open pit and in-stream sand and gravel operations mining more than 5,000 tons and increase bonded acreage fees.

In May 2015, four stakeholder meetings were held in Kansas City, Cape Girardeau, Springfield and Jefferson City. Stakeholders include the Missouri Mining Industry Council, Missouri Limestone Producers Association and other members representing mining businesses that will be affected by the proposed fee increase.

As a result of the meeting, stakeholders sent a consistent message: "Do not unfavorably increase fees for small operators as larger operations with multiple sites can more easily defray the permitting costs due to the amount of aggregate produced."

A tiered increase in the cap was proposed along with increasing the fee for each bonded acre and site fees were adjusted according to the size of the site as follows:

- The new Industrial Mineral fee structure will become effective January 1, 2017.
- The permit fee of \$800 is not changed. The cap of \$3,000 is increased to \$6,000 from January 1, 2017 to December 31, 2018. January 1, 2019 through December 31, 2020, the cap would be increased to \$7,500. January 1, 2021, the cap would be \$9,000 per permit application.
- The bonded acreage fee would be increased \$10 per bonded acre to \$13 per bonded acre. The site fee is proposed at:

<u>Acres</u>	<u>Site Fee</u>
.01-10	\$200
10.01-75	\$500
75.01-200	\$800
>200	\$1,000

COAL MINING

Introduction and Purpose

Through growing national concern over the environmental degradation caused by coal mining, Public Law 95-87 was passed in 1977 by the U.S. Congress. This law, also known as “The Surface Mining Control and Reclamation Act” dictated specific requirements for the reclamation of coal mined land, and established state regulatory authorities for the enforcement and monitoring of surface mine reclamation activities. The act also established programs and funding for reclaiming coal mine lands mined prior to May 2, 1977.

On May 3, 1978, the legislature amended Missouri’s Strip Mine Law establishing Chapter 444.535 RSMo, commonly referred to as the Interim Program Law. Requirements of this law include:

- Topsoil must be removed and replaced to a minimum 6-inch depth.
- All prime farmland soils must be removed and replaced to 40-inch depth.
- All mined land must be reclaimed to an equal or better land-use capability.
- Mined land must be backfilled and graded to approximate original contour.
- Coal waste and other acid-or toxic-forming material must be covered with a minimum of 4 feet of non-toxic material.
- A permanent vegetative cover compatible with the pre-mining land use must be established.

On May 17, 1982, the Missouri legislature passed The Surface Coal Mining Law (Chapters 444.800 - 444.970) to match federal standards established in the Surface Mining Control and Reclamation Act. The law made changes to the permitting process and granted the Land Reclamation Commission the authority to administer the abandoned mine land program. Coal companies were now required to submit baseline information about the hydrology, geology, soils, fish and wildlife and cultural resources of the proposed mining area, along with a detailed description of the proposed operation and reclamation plan. The most significant change to the reclamation requirements was that prime farmland soils must be removed and replaced to a 48-inch depth. These requirements, known as the Permanent Program Law, continue in effect to the present day.

Missouri coal production has declined from 4.2 million tons in 1987 to approximately 168 thousand tons by the end of fiscal year 2015.

This decline is largely due to industry demands for low-sulfur, western coal needed by power plants to reduce air pollution and meet emission standards required by the federal Clean Air Act. Most of Missouri’s coal reserves contain relatively high sulfur content, ranging from 2 to 7 percent by weight. However, Missouri coal has a relatively high British Thermal Unit (BTU), compared to western coal. Some power plants and some cement kilns have opted to mix Missouri’s coal with lower BTU western coal to increase energy production without exceeding sulfur emissions.

During the last two fiscal years, coal mining was concentrated in an area in southwestern Missouri where in places, coal seams contain lower levels of sulfur. During this time period, the Land Reclamation Program issued one coal mining permit and expansion for Hume West mine for 279 acres, and one exploration permit. Both permit actions are located in Bates County. At the end of fiscal year 2015, one surface coal mine was producing coal in Missouri. The remaining five permitted mines were in various stages of reclamation.



Hume West Mine, Continental Coal Inc.

Land Reclamation Program staff closely monitors the coal mining operation, including both coal removal and reclamation activities. Monthly inspections of each permit site are performed to ensure reclamation requirements are adhered to and continue until the reclamation liability release proving hydrologic balance of surface and groundwater, soil stability and vegetative production for a minimum of five years after final grading and seeding.

Permitting

Staff members are responsible for reviewing permit revisions and new permit applications. Land Reclamation Program staff personnel are professionally trained in specific technical areas and are responsible for reviewing technical plans with respect to their area(s) of expertise. Technical areas that must be reviewed include engineering, blasting, soil science, geology, hydrology, revegetation, land use plans, fish and wildlife protection, cultural and historical resources and reclamation technology. Staff members review all coal permit applications for adequacy and recommend approval or denial to the Land Reclamation Program staff director. The staff also conducts regular evaluations of existing permits and also provides technical assistance to the mining industry and the public.

A thorough review of surface coal mining permit applications, permit revisions and other permit-related actions are necessary to ensure all requirements of the law and regulations are met.

Reviewing permit processes includes determining all applications, as well as the review process itself; meet all legal and administrative requirements. The permitting requirements for coal mining are extensive, requiring careful evaluation of diverse and comprehensive environmental topics such as soil characteristics, surface and subsurface water quality controls, fish and wildlife information, cultural resources and land use planning. Reviews also focus on specific details such as engineering designs for sedimentation ponds and water diversions, blasting plans and hydrogeologic data to determine the probable hydrologic consequences of mining. Other permitting responsibilities include evaluating each applicant's legal compliance history with past mining activities and ensuring all public review requirements are fulfilled. Staff members also coordinate with other regulatory agencies to ensure the company proposing to conduct the mining activity has obtained other necessary environmental clearances and permits.

Bond Releases

Reclamation begins immediately after coal is removed from a strip mine pit. Regulations dictate a pit must be completely backfilled and graded no later than 180 days after coal removal. Topsoil must then be redistributed within an additional 270 days. The area must then be seeded during the first available growing season, with specific vegetation sufficiently established to control erosion by the end of the second year. Sediment ponds, diversions, explosive storage areas and maintenance pads also are subject to reclamation requirements once they become inactive or are no longer needed as

part of the mining operation. Only when these requirements are met can an operator obtain a release of reclamation bonds.

In 2006, bonding requirements were changed for surface coal mines from a bond pool, with a flat bonding rate for all areas, to full cost bonding. Full cost bonding requires an engineering evaluation the area to be mined determining the worst case scenario in terms of cost to reclaim should the company, for whatever reason, be unable to complete full reclamation. The bond amount is determined by the Land Reclamation Program and is then posted by the company before a permit to mine coal is approved and issued. The bond is held in escrow by the Land Reclamation Program until such time as reclamation is completed and approved by the staff director of the program. Bonds are released in phases as regulated reclamation milestones are met.

There were no bond releases during this period.

Alternate Fuels Incorporated (AFI) Permits

As noted in the 2008-2009, report mentioned here for background information: In accordance with the legal consent agreement entered into with Continental Insurance and Beachner Construction an over bonded amount of \$144,000.00 was released after the sureties mobilized for reclamation. The release was to the sureties for a portion of a permit associated with AFI. Shortly after the surety's mobilization one of the landowners filed suit against Missouri for the reclamation plan that had been approved. Several months following the filing of the lawsuit AFI received a multi-million dollar court settlement from the state of Missouri for interfering in a business deal. The company filed bankruptcy as there more financial claims against the company than available funds. Since the company does have the financial resources to perform the reclamation the sureties have suspended any further work until it is legally clear what reclamation plan will be followed and if the company will be required to complete the reclamation.

As noted in the 2010-2011 report, Christopher J. Redmond with Husch Blackwell, LLP, was assigned as the bankruptcy trustee for AFI. A reclamation plan was approved for permit #1990-01 as prepared by TRIAD Environmental Services and work began shortly afterwards. Permit revisions were approved by the LRP Director for Permits 1991-02 & 1996-01. Two of the three landowners associated with permit 1991-02 appealed to the Administrative Hearing Commission as being adversely affected by this decision. Since reclamation is proceeding AFI was moved from annual inspections to monthly inspections starting in June 2011.

As noted in the 2012-2013 report, the bankruptcy trustee has successfully completed the initial reclamation on permit #1990-01 and the Phase I reclamation liability release was approved by Program Director in July 2012 with a bond release of sureties for that permitted acreage released in December 2012. Reclamation work continues on permit #1996-01. The litigation by the landowners of two of the three properties on permit #1991-02 continues with only minimum reclamation activities continuing where possible on property that is not part of the litigation.

During this period of 2014-2015, all vegetative productivity requirements were met on permit #1990-01. Litigation on the land use change revision for permit #1991-02 ended with the judgment, by the Southern District Appellate Court, reversing the Commission's approval of the revision. During this period, there has only been reclamation on properties that were not part of the litigation. The reclamation on permit #1996-01 was completed and vegetative productivity studies were started.

Inspections

Reclamation activities are closely monitored to ensure the required performance standards are met and the reclamation plans approved in the company's mining permits are followed. Coal mine inspections are performed monthly. On-site inspections serve three primary functions:

- Ensure an operation is functioning in a manner consistent with applicable state laws.
- Ensure an operation is fully complying with the conditions of the permit.
- Provide a public record on the status of mining and reclamation at a site.
- Two styles of inspections are done, termed a complete and partial. Complete inspections are required once per calendar quarter. They involve a complete review of an operator's compliance with all permit conditions and state statutes. As the name implies, partial inspections are a review of an operator's compliance with some of the permit conditions and state statutes.
- Many aspects of a mining operation are evaluated during an inspection to ensure the following:
 - Mining occurs within the confines of the permit.
 - Topsoil is being salvaged and stockpiled.
 - All stormwater runoff from mined areas enters sedimentation ponds.
 - Pits and other areas of mine disturbance are promptly backfilled and graded.
 - Topsoil is replaced to the required thickness.
 - Vegetation is quickly re-established in order to control erosion.

Monthly inspections continue after an operation ceases mining coal. Continued monitoring ensures reclamation continues in an expedient manner and all conditions of the reclamation plan are followed. Only when an operator gains approval for a Phase II release (vegetation sufficient to control erosion) does the inspection frequency decrease from monthly to quarterly.

Enforcement

Notices of Violation may be issued when an operator is out of compliance with the conditions of the permit or with state regulations. These are only issued after efforts to correct noncompliance through the process of conference, conciliation and persuasion prove ineffective. In general, if a notice of violation is issued, a monetary penalty also will be issued. Because inspections are conducted each month, it is rare that a serious noncompliance would exist. Well-trained inspectors are able to identify when a mining or reclamation process is getting off-track in time to rectify the situation with the company before the need to issue formal enforcement occurs.

Cessation orders are an elevated form of a notice of violation and are a more serious form of enforcement. The department will issue an order when a condition or practice at the mine site constitutes imminent danger to the health and safety of the public or imminent environmental harm to land, water or air resources. Orders may require the immediate cessation of mining until the problem is corrected. Cessation orders, because of their seriousness, require immediate abatement by the operator. Failure to do so may lead to a revocation of the mining permit. Cessation orders also may be issued for a failure to abate a notice of violation within the required time frame.

If Cessation orders are not abated in a timely manner through the appropriate action on the part of the mining company, the next level of enforcement action is a Show-Cause Order. This means the operator is ordered to show why their permit should not be revoked and the reclamation bond forfeited. Show-Cause Orders may also be issued for other reasons such as for patterns of violations and uncorrected delinquent reclamation.

There were no violations issued during this period.

Bonding

Missouri's Surface Coal Mining Law (Chapters 444.800 - 444.970) was amended in 2006 to address changes mandated by the federal Office of Surface Mining. A condition of Missouri's reacquisition of primacy was to change the bonding system in Missouri from one of a bond pool to one of full cost bonding. The necessary regulation changes were made prior to full return of primacy to the state on Feb. 1, 2006 through emergency rulemaking. These rules remained in effect until such time as the normal rulemaking process was completed.

The former bond pool approach relied on a set amount of money per acre being posted by the permit applicant prior to receiving a permit to engage in surface mining of coal and this set amount was supplemented by payments into a bond pool from all companies based upon yearly coal production. As of August 2012, there are no remaining funds left in the A Bond Pool and as of June 2014, there are no remaining funds left in the B Bond Pool.

The present full cost bond approach requires the applicant to provide an estimate of the cost to reclaim a surface mine given the worst case scenario of the mining operation. That estimate is reviewed by program engineers and, when verified, that dollar amount is the amount of bonding required to be posted prior to the issuance of any surface mining permit for coal.

Bond Forfeiture Reclamation

Each permitted coal company in Missouri is required to provide financial assurances to ensure reclamation of the site after coal removal. Upon completion of reclamation to applicable standards, the coal company receives a release from the Land Reclamation Program. Should a coal company fail to provide reclamation to applicable standards the bonds are forfeited to the Land Reclamation Program and these bonds are used by the program to provide reclamation to the site mined by the coal company.

The Land Reclamation Program accomplished reclamation on the remaining 400.50 acres of bond forfeiture sites resulting in the complete release of five permits and four inspectable units.

Off-Site Impacts

An off-site impact is defined as anything resulting from a surface coal mining and reclamation activity or operation that causes a negative effect on resources, such as people, land, water, structures, etc. The program must regulate or control the mining or reclamation activity or result of the activity causing an off-site impact. In addition, the impact on the resource must be substantiated as being related to a mining and reclamation activity and must be outside the area authorized by the permit for conducting mining and reclamation activities.

There was one minor off-site impact identified during this period as a result of an exceedance of the National Pollution Discharge Elimination System at the Hume West mine.

ABANDONED MINE LANDS

Activities

Since the early 1840s, coal mining has at times been a major industry in the north-central and southwest portions of Missouri. Up to 6 million tons of coal was mined annually in the first three decades of the 20th century. Because mining companies gave little or no thought to the post-mining value of the land, some 67,000 acres of land were left abandoned prior to passage of Missouri's first strip-mine legislation in 1971. Although nature has adequately reclaimed much of this land over the years, nearly 11,000 acres have been identified that require at least some amount of reclamation work to correct a wide range of public health, safety and environmental problems. These problems include safety hazards such as steep and unstable highwalls and embankments, open mine shafts, abandoned mining equipment and facilities, dangerous impoundments and unsanitary trash dumps. Acid mine drainage and sedimentation from exposed coal waste and mine spoils also pollute and clog streams. Subsidence, caused when old underground mines collapse, may damage overlying buildings.

Abandoned mine land reclamation took a giant step forward when the U.S. Congress enacted Public Law 95-87, the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The Act outlined specific requirements for the reclamation of lands mined after May 2, 1977, and established programs and funding for reclaiming abandoned mine lands. In January 1982, Missouri received approval from the federal Office of Surface Mining to operate the Abandoned Mine Land program and conduct reclamation work in the state.

Reclamation Funding

The Abandoned Mine Land (AML) activities of Land Reclamation Program are funded by the U.S. Department of Interior's Office of Surface Mining Reclamation and Enforcement AML Reclamation fund. All of the money in the fund is collected from active coal mining companies through fees charged on the tonnage of coal mined since passage of Surface Mining Control and Reclamation Act. The Office of Surface Mining Reclamation and Enforcement distributes the fund to the eligible states and American Indian tribes. To date, Missouri has received \$91.3 million in AML grants and cooperative agreements from the fund to conduct reclamation work in Missouri. Missouri has an excellent record for obligating the funds received. Through state fiscal year 2015, 95 percent of all grants received have been contractually obligated towards the completion of reclamation projects.

Because of steadily declining coal production since the late 1980s, Missouri and other Midwestern states have received decreasing allocations of funding. In 1987, the U.S. Congress established an annual minimum base funding level in the amount of \$2.0 million to allow states with significant abandoned coal mine problems but limited coal production to continue their AML programs. However, the \$2.0 million minimum base amount was consistently being reduced to \$1.5 million in the federal appropriations process. As part of the 2006 amendments to SMCRA, the minimum base funding to states was incrementally increased over five years to the current maximum of \$3 million per year. Furthermore, these funds are administered as mandatory grant funds that no longer go through the federal appropriation process.

Reauthorization

The AML reauthorization was signed into law by President George W. Bush December 20, 2006. Following a 3½ year-long legislative debate in congress over AML reauthorization, the comprehensive legislation was passed as part of the Tax Relief and Health Care Act of 2006. This bill represented the culmination of more than 10 years of work by the states, tribes, federal government and other supporters to address the future of the AML

AML Reclamation Accomplishments Through June 30, 2015				
Problem	Reclaimed	Under Construction	Under Design	Total
AML Projects (#)	180	1	4	185
Mine Openings (#)	289	0	7	296
Highwall (ft.)	113,946	2,291	5,645	121,882
Hazardous Facilities (#)	33	0	0	33
Subsidence (ac.)	8	0	0	8
Surface Burning (ac.)	19	0	0	0
Underground Mine Fire (ac.)	7	0	0	7
Unsanitary Trash Dumps (ac.)	84	0	0	84
Dangerous Piles/Embankments (ac.)	832	0	55	887
Clogged Streams (miles)	10.8	0	0	10.8
Clogged Stream Lands (ac.)	1,628	0	18	1,646
Polluted Water: Human Construction Agricultural or Industrial (#)	65	0	12	77
Hazardous Impoundments (#)	27	3	11	41
Polluted Impoundments (ac.)	96	0	0	96
Haul Road (ac.)	1	0	0	1
Spoil (ac.)	1,648	0	0	1,648
Gob (ac.)	153	0	0	153
Slurry (ac.)	69	0	0	69
Total AML Acreage	4,544	0	73	4,598

AML Reclamation Accomplishments

July 1, 2013 through June 30, 2015

Final Designs Completed

Project Name	County	Acres	AML Problems*
Germantown L-Pit	Henry	57	DPE, DH, CSL, PWAI, IRW, SA
Little Tipple Phase 2 (Laird Pit)	Bates	15	DH, HWB, SA
Northeast Aurora Shafts	Lawrence	2	2 VO
Willis Shaft	Jasper	1	1 VO
Aurora National Guard Shaft	Lawrence	1	1 VO
Juggernot Shaft	Jasper	1	1 VO
Kingdom Coal	Callaway	20	DH, DPE, CSL, IRW, SA
North Sergeant Shaft	Jasper	1	1 VO
Oronogo Subsidence	Jasper	1	1 VO
Swift Highwall	Henry	20	DH, HWB, CSL, SA
Carterville Shafts	Jasper	2	2 VO
Hertz St Subsidence	Macon	1	S
Parry	Barton	20	DH, HWB, SA
Valle Shafts Phase 1-Backfill	St. Francois	7	7 VO
Total Acres		149	

Construction Contract Awards

Millersburg	Callaway	40	DH, PWAI, CSL, DPE, SA
Little Tipple Phase 2 (Laird Pit)	Bates	15	DH, HWB, SA
Northeast Aurora Shafts	Lawrence	2	2 VO
Willis Shaft	Jasper	1	1 VO
Aurora National Guard Shaft	Lawrence	1	1 VO
Juggernot Shaft	Jasper	1	1 VO
Kingdom Coal	Callaway	20	DH, DPE, CSL, IRW, SA
North Sergeant Shaft	Jasper	1	1 VO
Oronogo Subsidence	Jasper	1	1 VO
Swift Highwall	Henry	20	DH, HWB, CSL, SA
Carterville Shafts	Jasper	2	2 VO
Hertz St Subsidence	Macon	1	S
Parry	Barton	20	DH, HWB, SA
Valle Shafts Phase 1-Backfill	St. Francois	7	7 VO
Total		132	

Construction Contract Completions

Ardath Highwall	Barton	90	DH, HWB, GO, CSL, SA
Little Tipple Highwalls	Bates	15	DH, HWB
Millersburg	Callaway	40	DH, PWAI, CSL, DPE, SA
Little Tipple Phase 2 (Laird Pit)	Bates	15	DH, HWB, SA
Northeast Aurora Shafts	Lawrence	2	2 VO
Willis Shaft	Jasper	1	1 VO
Aurora National Guard Shaft	Lawrence	1	1 VO
Juggernot Shaft	Jasper	1	1 VO
Kingdom Coal	Callaway	20	DH, DPE, CSL, IRW, SA
North Sergeant Shaft	Jasper	1	1 VO
Oronogo Subsidence	Jasper	1	1 VO
Swift Highwall	Henry	20	DH, HWB, CSL, SA
Carterville Shafts	Jasper	2	2 VO
Hertz St Subsidence	Macon	1	S
Parry	Barton	20	DH, HWB, SA
Valle Shafts Phase 1-Backfill	St. Francois	7	7 VO
Total Acres		237	

program. These new changes in federal law have resulted in substantial increases in AML funding to states and tribes and allowed the program to focus AML reclamation on projects that benefit public health and safety.

The AML reauthorization, which amended the 1977 Surface Mining Control Act, was a significant windfall that provides many benefits to the Missouri AML Program. It extended federal AML fee collection authority and funding of the AML program for an additional 15 years until the year 2021. The changes doubled the amount of AML funds that Missouri and the other minimum base states receive for completing reclamation projects that benefit public health and safety. In addition, the state of Missouri is designated as a recipient of AML funds, even if it cannot continue to operate the coal regulatory program.

Because the AML fee collection is set to sunset in year 2021, the National Association of Abandoned Mine Land Programs member states are actively seeking to extend the program through reauthorization of funding. An extension of the fee collection and program would require an additional amendment to SMCRA be signed into federal law.

Other notable changes made by the 2006 Amendments include:

- AML fees were reduced by 20 percent over the duration of the extension.
- Previously unappropriated state share balances will be paid to states and tribes over a seven-year period.
- AML allocation formula was modified to direct more funds to areas with most historic coal-related problems.
- AML funds are distributed annually outside of congressional appropriation process.
- Lien provisions were streamlined.
- Priorities for AML funding were redefined.

*Key to AML problem abbreviations:

IRW..... Industrial or residential waste dump

VO..... Vertical opening

SA Spoil area

P Portal

SL..... Slurry (coal waste)

DH Dangerous highwall

GO Gob (coal waste)

DPE..... Dangerous piles or embankments

PWAI... Polluted water agricultural/industrial

CS Clogged stream conditions

S..... Subsidence

WA..... Water problems (acid mine
..... drainage & sedimentation)

HEF Hazardous Equipment and Facilities

Inventory and Ranking

Public Law 95-87 requires that the highest priority abandoned coal mine sites be reclaimed before problems created by mining other commodities are addressed. The order in which abandoned mine land is reclaimed is initially determined by classifying the problem sites into three broad categories of priority. Priority I and II problem sites are reclaimed first since they pose a threat to the public health and safety. Priority III problem sites that adversely affect the environment may be addressed simultaneously if they are located adjacent or are contiguous to priority I and II problems. Otherwise stand-alone priority III features may not be reclaimed until all priority I and II sites have been reclaimed. P.L. 95-87 also provides that, at the request of the governor of the state or head of the tribal body, certain Priority I non-coal reclamation projects may be undertaken on a case-by-case basis before the priorities related to past coal mining have been fulfilled. The Land Reclamation Program has been closing extremely dangerous non-coal mine shafts under this provision since 2001. The information pertaining to Missouri's abandoned mine lands is contained in the AML Inventory. This database currently contains 275 AML problem sites. It is continually updated as existing site conditions change or new sites are identified.

On an annual basis, the unfunded high priority (Priority I and II) problem sites are ranked and selected for future reclamation work according to the severity of existing problems. To date, an estimated \$128 million in Priority I, Priority II, and adjacent/ contiguous Priority III AML problems have been inventoried in Missouri. Of this total, \$71 million remains unfunded.

Missouri's Abandoned Mine Land Emergency Program

The Land Reclamation Program is responsible for investigating all AML emergency complaints in Missouri and conducting reclamation work when emergencies are declared. An AML emergency is a sudden event related to past coal mining

that has a high probability of causing substantial harm. There also must be a need to abate the emergency situation more quickly than would be possible under normal AML program operations. Sometimes an emergency complaint constitutes an eligible coal mine problem, but the situation does not meet the emergency criteria. In this case, reclamation work could still be undertaken by the Land Reclamation Program under the normal AML program. The proposed reclamation project, however, would be subject to the project ranking and selection process and would have to compete for available grant funds along with other priority I and II problem sites.

During fiscal years 2014 and 2015, the Land Reclamation Program conducted 1 coal emergency investigation. This emergency complaint regarded what was initially a 10 foot diameter subsidence behind a residence near the town of Bevier; associated with an area of past underground coal mining. The Land Reclamation Program conducted an on-site investigation and determined that the subsidence posed a significant threat to the nearby occupants. Background research of mine maps showed the area nearby was undermined. Therefore, the LRP hired a contractor to conduct exploratory drilling. The contractor discovered voids underneath the house at a depth of 40 feet. The contractor then pumped grout into the voids to stabilize the home.

Abandoned Mine Land Featured Projects

Kingdom Coal Reclamation Project

The Kingdom Coal Abandoned Mine Land Reclamation Project is located near New Bloomfield in western Callaway County. This project was undertaken in order to reclaim approximately 20 acres of abandoned coal mine lands. Large portions of this site were covered with barren and eroding coal waste piles. These piles were polluting a tributary of Hiller's Creek with sediment and acid mine drainage.



An incised coal mine pit and associated highwall posed a significant danger to the nearby landowners' children and visitors. An impoundment also was severely eroded and nearly breached.

Reclamation at this site included hazard abatement, reduced erosion, improved stream stabilization, improved vegetation and improved water quality. This project reclaimed approximately 20 acres of coal mine land. This work eliminated 245 feet of dangerous highwall and regraded 2 acres of steep barren and eroding coal waste piles. The dangerous highwall and hazardous water body was eliminated by backfilling with spoil material. The dangerous piles and embankments and barren mine spoils were graded to gently sloping terrain, and the exposed coal was buried on-site. Upon completion of final grading, the site was limed, fertilized and seeded with a cool season grass mixture, then mulched and crimped.



On August 19, 2014, C.L. Richardson Construction Co. of Ashland was awarded project number Y1405-01. The project was deemed substantially complete December 9, 2014, with a final total cost of \$210,077.23.



Swift Highwall Reclamation Project

The AML unit completed the Swift Highwall Abandoned Mine Land Reclamation Project. The site reclaimed a section of dangerous highwall along a well-travelled county road and addressed several dangerous piles and embankments. The Swift Highwall is located on privately owned land just west of County Road 1151, near the town of Montrose in southwestern Henry County.

The Swift Highwall project consisted of approximately 20 acres in what is known as the Germantown Problem Area. It eliminated the health and safety hazards associated with one 1,300 feet long highwall, which was situated immediately adjacent to the county road. Other activities included: partial backfilling to move a hazardous water impoundment further away from the road; construction of a replacement pond, repairs made to a leaking dam; eliminating two failing stream culverts and replacing them with the construction of a low water crossing; and grading and re-contouring the areas of disturbance.

The project was awarded to Tri-Smith Construction LLC., located in Carrollton. Construction activities started February 24, 2014, and were deemed substantially complete June 11, 2014. Final payment amount was \$289,101.77.



Photo shows the proximity of the county road to the dangerous highwall and hazardous water body associated with the Swift Highwall site.



Post construction photo of the Swift Highwall site. Note that elimination of the dangerous highwall and that the hazardous impoundment has been moved further away from the county road.



Post construction photo of the new low water crossing that replaced the failing metal culverts at the Swift Highwall site.

Hertz Street Drilling and Grouting Project

On Thursday April 23, 2015, LRP staff responded to a report of a subsidence in the back yard of a home in Bevier. This is the same property where LRP conducted a subsidence reclamation project in 2005; then in the front yard. Upon initial investigation, an approximately 10 foot diameter by 5 foot deep hole was located approximately 12 feet north of the home. This project was determined to be an emergency subsidence project due to the close proximity of the subsidence to the residence and the presence of small children and pets. During research LRP staff located mine maps showing coal mining in the area near the house. LRP hired Freddy Van's Inc. and utilized the drilling and grouting contract to conduct exploratory drilling.

On April 23, the contractor started drilling exploratory holes around the house. On April 24, the original collapse feature was excavated approximately 10 feet deep using a trackhoe, and was backfilled with limestone rock. Between the dates of April 23-24 and April 27-29, a total of 12 exploratory drill holes were drilled around the perimeter of the residence in an attempt to identify subsurface mine workings located beneath the footprint of the house. Of the twelve holes, a total of four encountered subsurface voids; all at approximately 40 feet. On May 12, employees from Freddy Van's Inc. began pressure grouting and continued the next day. A total of 257 cubic yards of grout was pumped into the holes. The final contract cost was \$63,118.70.



Hertz street drilling and grouting project underway.

Parry Reclamation Project

On January 21, 2015, the Parry Reclamation Project contract was awarded to Double S Dirt Works Inc., located in Liberal, in the amount of \$287,245. A pre-bid meeting was held December 4, 2014, at Prairie State Park. Work commenced February 11, 2015. The project is composed of two separate sites

located immediately outside of the town of Burgess in western Barton County. The project was deemed substantially complete April 28, 2015. The project reclaimed approximately 20 acres of spoil area and eliminated three hazardous water bodies and two dangerous high walls totaling 2,300 feet in length.



Dangerous highwall and hazardous waterbody along Highway P.



Dangerous highwall and hazardous waterbody along Highway P after construction.

Millersburg Reclamation Project

On Thursday April 23, 2015, LRP staff During the summer of 2013, the Abandoned Mine Land Unit initiated the Millersburg Reclamation Project that addressed some of the most adversely affected abandoned mine land areas impacting Miller's Creek in Callaway County. More than 50 acres of land; comprising barren and eroding spoil piles, a dangerous highwall, and lands that were contributing acid-forming sediment into the stream, were reclaimed. Additionally, three acid water bodies, having pH levels near 3.6 were on-site. These pit impoundments were backfilled with spoil materials and eliminated.

The mine lands were reclaimed by grading down the large barren piles, backfilling the dangerous highwall, and stabilizing eroded areas through grading and establishment of grass vegetation. Furthermore, it was important to fill and eliminate the three acidic ponds that discharged acid water into Miller's Creek during heavy stormwater events. Two locations along Miller's Creek had vertical spoil piles that were falling into the creek and causing significant amounts of mine spoil and sediments to enter the stream. These two spoil piles were excavated to lessen the slopes and significantly reduce the amount of deposits that were contaminating and clogging Miller's Creek.

Approximately 200,000 cubic yards of acidic coal-mine waste was graded. Throughout the grading process, the acid soils were treated with more than 3,100 tons of agricultural lime obtained from a

local limestone quarry. Approximately 72,000 cubic yards of non-toxic soil cover material was excavated from other locations of the site and was spread over the reclaimed area to cover the acidic subsoils and promote successful revegetation.

Following grading, 50 acres of disturbed land were planted with grass, legumes and temporary crops to control erosion. Approximately 15 acres were immediately seeded with perennial cool-season grass and legumes. The remaining 35 acres were seeded with successive temporary cover crops of wheat; plantings of oats, cow peas, radishes, and turnips; and finally pearl millet in the summer of 2014. These plantings of temporary vegetation aid in the soil development by adding organic matter into the newly graded spoil material. In the spring of 2015, the 35-acre area was seeded with a mixture of perennial warm-season native grasses and legumes to permanently stabilize the site.

The reclamation work is expected to improve water quality in Miller's Creek by reducing the amount of acid-forming sediments that erode into the stream. Additionally, water quality of the creek is expected to improve with the elimination of the acid water impoundments that discharged low pH water into the creek following heavy rains or snow melts.

This project was awarded to Pangea Group of St. Louis, Mo. Construction activities began July 1, 2013, and were deemed substantially complete on February 4, 2014. Final payment amount for this project was \$611,650.

Barren spoil piles covered the Millersburg site.



Spoil piles are graded and pushed to fill nearby pits.

Area has been reclaimed and revegetated.



AML NON-COAL RECLAMATION PROJECTS

Although the Land Reclamation Program uses federal money designated to reclaim abandoned coal mines, the money may also be used to reclaim non-coal vertical mineshaft openings if they meet certain criteria. These non-coal problems are allowed to be corrected with a request from the governor if it is necessary for the protection of the public health, safety, and general welfare from extreme danger, thereby meeting Priority I problem criteria.

Between July 1, 2013 and June 30, 2015, nine dangerous non-coal shafts were closed in the Joplin/

Tri-State Mining District while an additional 7 were backfilled in St. Francois County. Two notable projects known as the Aurora National Guard Shaft located in Aurora and the Carterville shafts located in Jasper County sealed mine openings that suddenly developed. The latter project encompassed sealing two shaft openings located near residential homes in Carterville. Reclamation of these shafts included excavating to bedrock or solid earth and constructing a steel-reinforced concrete plug over the open shaft.

Aurora National Guard Shaft Project

Subsidence reportedly occurred in May 2013, at the Aurora Missouri National Guard Readiness Center. National Guard staff contacted the Land Reclamation Program in December 2013 about the possibility of technical assistance and the subsidence was deemed a Priority 1 vertical opening. The Vertical Opening consisted of a 10 foot diameter opening that was 9 feet deep. The opening was inside a National Guard vehicle compound. Exploratory drilling was conducted at the site February 25, 2014. Test digs to quantify the extent of groundwater saturation were conducted on March 27. It was determined that groundwater in significant quantities was present at 3 feet below the surface, and that excavating to bedrock would require pumping water. It was decided that a 15 foot by 15 foot reinforced concrete slab should be constructed over the opening.

The Land Reclamation Program contracted with Kenny Singer Construction for the amount of \$5,595.20 and excavation began April 9, 2014. A 15 foot square area was excavated 7 feet below the surface. Concrete was then poured into the flooded hole and rebar was placed in two mats into the concrete. The concrete was allowed to cure overnight and the contractor then covered the pad with excavated material.



Subsidence in the parking lot of the Aurora National Guard Readiness Center.



Contractor is placing concrete into the excavated opening.



The shaft opening in the middle of the homeowner's yard.

Carterville Shaft Project

On April 6, 2015, the Land Reclamation Program was informed of a "sinkhole" that had opened the previous weekend in the yard of a house in Carterville. Initial reports described the hole as 30-40 feet deep and 12-16 feet wide at the opening with vertical sides, and filled with water at an approximate depth of 10 feet. A second suspected shaft was reported just down the street in the front yard of another house. This feature showed radial cracks in the ground approximately 10 feet in diameter and it appeared to have subsided several inches. LRP staff investigated the open hole the next day. They measured the opening at 15 feet in diameter at the surface and 30 feet deep. This subsidence event was determined to be an emergency situation. Bids from contractors were solicited via phone.

On Thursday April 9, LRP staff and the low-bid contractor were on-site and excavated the opening. The contractor attempted to drain the shaft by pumping water but was unsuccessful due to rapidly refilling groundwater. Next, the contractor and city employees dumped truckloads of asphalt into the hole throughout the day, but the material appeared to disappear and did not bridge the hole underwater.

On Friday April 10, the contractor hauled in and placed two concrete slabs into the hole along with two loads of large concrete chunks. This did finally appear to bridge the hole. More asphalt fill was dumped and a 1-foot layer of concrete was placed to form a stable base and left to cure over the weekend.

On Tuesday April 14, the contractor constructed the 15 foot by 11 foot rebar cage for the shaft, placed it in the hole on top of the previous concrete and poured 50 yards of concrete to form the plug. The following day, the contractor and LRP staff excavated the second suspected shaft. A large number of old glass bottles and bricks were discovered in the excavated material indicating this area had been filled, but no large voids or open shafts were found. A steel cage was placed in this excavated hole, and a concrete plug was poured. The following week, both holes were backfilled and covered with topsoil. The final project cost was \$36,244.76.



Pouring concrete in the shaft area with the rebar cage and stabilized bottom.

Occasionally, a dangerous mine shaft may be closed by backfilling with rock, soil material, or backfilling with concrete to create a monolithic concrete plug. These closure methods are quick and relatively inexpensive but often may not be the best choice. Most often a more costly, yet more permanent closure method is preferred. This more permanent closure consists of excavating the loose soil material around the hole down to the bedrock; constructing a platform; pouring a wedge-shaped, steel-reinforced, concrete plug at the top of the shaft; and

backfilling over the concrete with earthen material. A closure of this type ranges typically ranges from around \$12,000 to \$20,000 per shaft but can vary based upon the specific conditions of each shaft.

Currently, seven non-coal shafts are in the inventory to address. However, it is suspected that there are many more open shafts that we are unaware of that will need to be closed. Dangerous mine shafts will continue to open up (especially in the Tri-State Lead/Zinc Mining District in the Joplin area) and will be investigated and closed to protect the public.



Mine Shaft Collapse near Joplin. Typical 10 foot by 10 foot non-coal vertical mineshaft opening 150 feet deep.

INDUSTRIAL MINERALS

Legislative and Rule Changes

On August 28, 2014, the Land Reclamation Commission was renamed to the Missouri Mining Commission. In addition commission membership and qualifications was amended to add another commissioner who has training and experience in subsurface mining, three members of the commission may belong to the same political party and two members may have a direct connection to the mining industry 444.520 RSMo.

The Land Reclamation Act 444.760-444.790 RSMo underwent changes that include:

1. Inclusion of the following minerals: cadmium, barium, nickel, cobalt, molybdenum, germanium, gallium, tellurium, selenium, vanadium, indium, mercury, uranium, rare earth elements, platinum group elements, manganese, phosphorus, sodium, titanium, zirconium, lithium, thorium, or tungsten 444.765(11) RSMo.
2. Definitions were added/amended at 444.765.1:
 - A. (4) "Commission", the Missouri mining commission in the department of natural resources created by section 444.520;
 - B. (7) "Director", the staff director of the Missouri mining commission or his or her designee;
 - C. (11) "Mineral", a constituent of the earth in a solid state which, when extracted from the earth, is usable in its natural form or is capable of conversion into a usable form as a chemical, an energy source, or raw material for manufacturing or construction material. For the purposes of this section, this definition includes barite, tar sands, oil shales, cadmium, barium, nickel, cobalt, molybdenum, germanium, gallium, tellurium, selenium, vanadium, indium, mercury, uranium, rare earth elements, platinum group elements, manganese, phosphorus, sodium, titanium, zirconium, lithium, thorium, or tungsten; but does not include iron, lead, zinc, gold, silver, coal, surface or subsurface water, fill dirt, natural oil or gas together with other chemicals recovered therewith;
3. "Notwithstanding any statutory fee amounts or maximums to the contrary, the director of the department of natural resources may conduct a comprehensive review and propose changes to the fee, bond, or assessment structure as set forth in this chapter. The comprehensive review shall include stakeholder meetings in order to solicit stakeholder input from regulated entities and any

other interested parties. Upon completion of the comprehensive review, the department shall submit a proposed fee, bond, or assessment structure with stakeholder agreement to the Missouri mining commission. ..." 444.768.1 RSMo.

4. Public Notification Requirements at 444.772 10. At the time that a permit application is deemed complete by the director, the operator shall publish a notice of intent to operate a surface mine in any newspaper qualified pursuant to section 493.050 to publish legal notices in any county where the land is located. If the director does not respond to a permit application within forty-five calendar days, the application shall be deemed to be complete. Notice in the newspaper shall be posted once a week for four consecutive weeks beginning no more than ten days after the application is deemed complete. The operator shall also send notice of intent to operate a surface mine by certified mail to the governing body of the counties or cities in which the proposed area is located, and to the last known addresses of all record landowners whose property is:

- (1) Within two thousand six hundred forty feet, or one-half mile from the border of the proposed mine plan area; and
- (2) Adjacent to the proposed mine plan area, land upon which the mine plan area is located, or adjacent land having a legal relationship with either the applicant or the owner of the land upon which the mine plan area is located.

The notices shall include the name and address of the operator, a legal description consisting of county, section, township and range, the number of acres involved, a statement that the operator plans to mine a specified mineral during a specified time, and the address of the commission. The notices shall also contain a statement that any person with a direct, personal interest in one or more of the factors the director may consider in issuing a permit may request a public meeting or file written comments to the director no later than fifteen days following the final public notice publication date. If any person requests a public meeting, the applicant shall cooperate with the director in making all necessary arrangements for the public meeting to be held in a reasonably convenient location and at a reasonable time for interested participants, and the applicant shall bear the expenses.

5. 444.773 RsMo. Director is authorized to issue or deny a permit after a public meeting and a

party that is unduly affected by the decision may appeal the directors decision to the Administrative Hearing Commission.

There have been no rule changes in 2014 or 2015. Staff currently is comparing the rules to The Land Reclamation Act for appropriate additions, revisions and rescissions.

Public Participation

When applying for a new site, transferring an existing site or applying for an expansion, an operator is required to send a notice of intent to operate a surface mine. The operator is required to send the notice by certified mail to all first tier landowners, not related to the company within one-half mile of the mine plan boundary and to the governing body of the counties or cities where the proposed mine area is located. The operator also is required to publish a public notice of intent in a newspaper that is qualified to run public notices and is located in the county where the proposed mine is located. The public notice must be printed once a week for four consecutive weeks. The public notice requirement also allows the public an opportunity to provide comments or request a public meeting. The public comment period lasts for about 45 days. Operators are required to hold a public meeting if one is requested. Operators also are meeting with great success in holding their own version of a public meeting or “open house” neighborhood gatherings to discuss mine plans when proposing a new site.

Since Aug. 28, 2001, 58 public meetings have been held based on the 2001 edition of the Land Reclamation Act. Attendance figures at the public meeting ranged from one individual to a crowd of more than 100 people. Forty-six of the public meetings resolved the concerns expressed by the public, thus eliminating requests for hearings before the Missouri Mining Commission. Public meetings provide a forum for the public to better understand or resolve issues related to a proposed mine site. They also provide a starting point for a company to reveal the proposed mine plan and provide responses to the public’s concerns. Some of the topics covered at the public meetings involve impacts to air quality, water quality, permitting issues, blasting and livelihood issues. The communication at the meetings allows everyone the opportunity to share and understand the potential impacts a proposed surface mine may present.

Following a public meeting, The Land Reclamation Act at Section 444.773.3, RSMo, requires the staff director to make a decision regarding the issuance or denial of an applicant’s permit. The director’s decision can be appealed to the Administrative

Hearing Commission. If a hearing is held, the Administrative Hearing Commission would then make a recommendation to the Missouri Mining Commission. The decision of the Missouri Mining Commission could then be appealed to the proper court of appeals.

The industrial minerals permitting program continues to look for ways to improve its methods of helping the public to understand the industrial minerals permitting procedures. Each year, citizens living near proposed mines request six to ten public meetings about the issuance of permits.

The Land Reclamation Commission granted nine hearings since the 2001 edition of The Land Reclamation Act. Requests for hearings require a tremendous amount of staff time along with resources to address, and will become increasingly common as mining companies look to open sites near heavily populated areas. In seven of the cases, the operator was issued a certificate to operate a surface mine. One case involved the operator withdrawing their application. On May 23, 2013, the commission granted a hearing for AA Quarry’s permit application. On June 17, 2013, Bart Tichenor was selected to serve as Hearing Officer. After multiple hearing dates in mid-2014, the commission issued a permit to engage in surface mining to AA Quarry November 20, 2014.

Since the enactment of law (444.773 RSMo), from August 28, 2014, to December 31, 2015, 11 public meetings have been held and no hearings requested through the Administrative Hearing Commission.

New sites and expansions to existing sites are needed in order to provide building commodities that meet the needs and demands of ongoing and new construction. It is likely that sometime in the future, changes may need to be implemented to associated statutes, rules or internal policies for the Land Reclamation Program to better respond to the needs of the environment, the unregulated community and companies that mine industrial minerals.

Routinely, the concerns brought to public meetings involve issues outside the regulatory authority provided in The Land Reclamation Act. These issues include concerns about blasting, safety on public roads and the mine’s effect on property values. The public meeting process has brought an acute awareness to the department about what is most troubling to the citizens. In return, the public has an opportunity to learn more about the reclamation requirements under The Land Reclamation Act. Continued contact will help pave the way for the citizens to resolve their concerns about mining.

Permitting

Industrial mineral mining permit certificates are issued for a one-year period. The industrial mineral permits must be continually renewed until the Missouri Mining Commission or staff director deems all mined land covered by the permit has been fully reclaimed. Approximately 700 new or renewed permits were issued in the past two years. Since some permits contain multiple sites, the number of permitted sites is substantially higher. In addition to the new and renewed permits, staff spent a considerable amount of time reviewing other permit actions, including permit transfers, expansions, amendments and consultations with the Missouri Department of Conservation. Fees collected from industrial mineral permits are used to conduct necessary regulatory functions.

Inspections

Prior to 2007, the state was separated into at least four geographic area inspection units. Now, the state is divided into two geographic area inspection units with at least two inspectors assigned to each unit. Each unit contains about 57 counties. Not all counties have an industrial mineral site. When staff wanted the state divided into two regions, it was noted that some areas became more active at times, when compared to others. Before the change, one staff member had to investigate a lot of complaints in the southwest portion of the state while inspection staff assigned to the northeast portion of the state

had a relatively normal schedule. Now, at least two inspection staff members share an assigned area to help maintain a relatively normal workload.

Operators who have been in the business for more than five years have undoubtedly seen changes in inspection staff. Many operators prefer the same inspector each year for the purpose of consistency. The program will accommodate their request as often as possible.

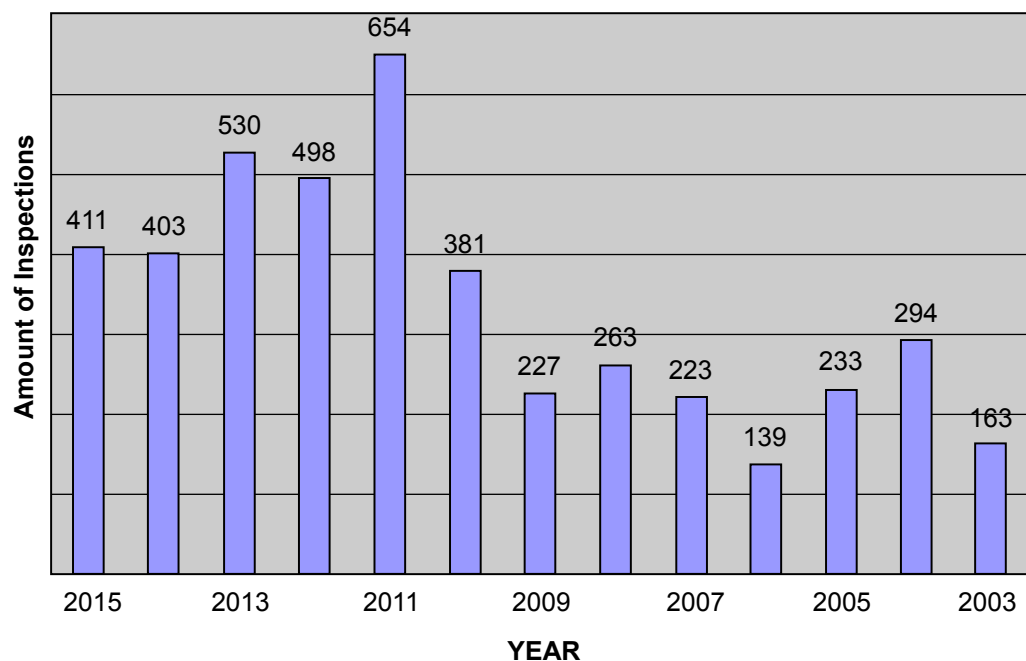
Inspectors are limited to the amount of on-site inspections they can perform in a given year, as they conduct permitting and other actions as well. Mine operations range in size from 1 acre gravel bars to some sites being greater than 300 acres such as limestone quarries. In 2014, there were 779 permitted industrial mineral sites, and 403 inspections were conducted. In 2015, there were 800 permitted mine sites, and 411 inspections were conducted. These total numbers are consistent in average when compared to the number of inspections conducted over the past few years.

Types of Inspections

In 2014 and 2015, on average, 407 site inspections were conducted. Inspections typically fit into three categories:

- Regular Inspections
- Complaint Inspections
- Bond Release and Other Inspections

Industrial and Metallic Mineral Inspections Since 2003



Regular Inspections

Regular Open Pit inspections are conducted to determine if an operator is in compliance with the approved permit and the applicable performance requirements. Performance requirements checked by inspectors include timeliness of reclamation, safety barriers, lateral support, erosion and siltation control, grading, topsoil handling and revegetation. Inspectors also evaluate each mine site to ensure all mining disturbance is confined to the permitted and bonded area and the approved post-mining land uses are being established.

In-stream sand and gravel inspections now involve performance standards. Inspectors evaluate the mined area on the gravel bar to make sure the material being excavated is unconsolidated. Inspectors also look to make sure there is no mining below the waterline, no relocation of stream channels, no sorting or washing of gravel on the gravel bar, and an undisturbed buffer of 10 feet exists from the flowing water



Houston Ready-Mix, Texas County.



Brickey's Quarry, Ste. Genevieve County.

Concern Inspections

Concern inspections are conducted after the program receives notification that an industrial mineral operation may be in violation of The Land Reclamation Act. Concerns filed may involve blasting, noise, truck traffic, water pollution, digging in flowing water, pumping turbid water from a pit, erosion or siltation. Following an investigation, the inspector and operator often are successful in resolving a citizen's concern in a timely manner. However, many concerns related to

mining operations, such as blasting and noise, are not regulated by the Land Reclamation Program and are referred to the appropriate regulatory authority.

The department requires a concern be investigated within 30 days. The goal is to respond within 14 days of receiving a concern, however, an investigation usually is conducted within seven work days. There were 34 concerns filed and investigated in 2014, and 27 concerns filed and investigated in 2015.



Topsoil clearing for fill dirt, Jefferson County.

Bond Release and Other Inspections

Bond and reclamation responsibility release is an important part of the mine closure process. Bond release inspections are conducted at the operator's request when reclamation has been completed. The mining company will also send the landowner a letter announcing the intent to seek a release of the mined land. The landowner may request a hearing before the Missouri Mining Commission if they feel the land is not properly reclaimed and likewise if the bond release application is denied, the operator may request a hearing.

The focus of the bond release inspection is to determine if the mine site has been reclaimed in accordance with the reclamation plan. The inspector must evaluate if the operator has established the designated post mining land uses. Post mining land uses may be designated as wildlife habitat, agricultural, development or water impoundment. At least two growing seasons must pass after an area has been planted before the

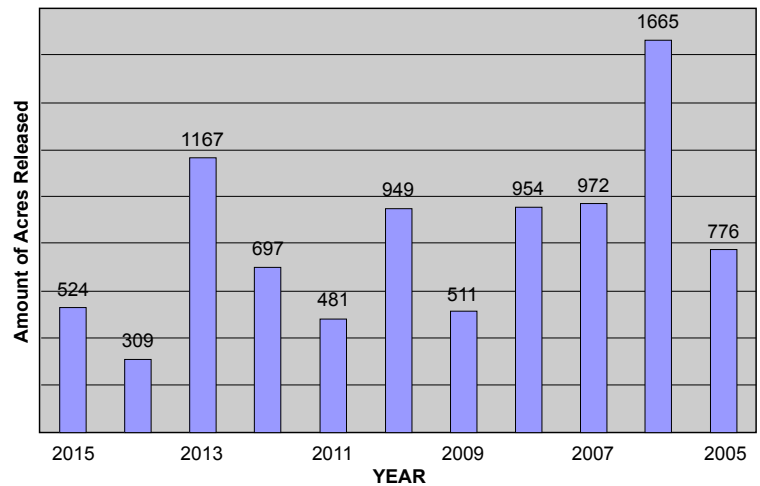
success of revegetation can be judged. Land never affected by mining that is under permit and bond may be released as unaffected.

The staff director determines if the bond, or any portion thereof, should be released. When mined land is properly reclaimed, a request for approval for bond release is made to the Missouri Mining Commission or staff director. If either the Missouri Mining Commission or staff director approves the request for approval of reclaimed land, the reclamation performance bond is released back to the operator. The commission or staff director approved the release of 309 acres of reclaimed mine land in 2014 and 524 acres in 2015.

To obtain a "Request for Approval of Reclaimed Land" form, visit the department's website at dnr.mo.gov/forms/780-0946-f.pdf or contact the Land Reclamation Program by telephone at 573-751-4041.

The department and programs also are conducting environmental assistance visits for new operators. Typically, the department allows an operator to conduct operations for a few months before it conducts an initial inspection. Inspectors typically let a new operator conduct operations for a two-month period and then see what changes the operator may need to make to stay in compliance with applicable mining laws. Assistance visits are another type of inspection. If an operator requests an inspection to see how to conform to the mining laws, an inspector will provide that type of assistance inspection. Since 2007, staff annually inspects every site that is within the watershed of Outstanding State Resource Waters or Outstanding National Resource Waters.

Acres Released Since 2005



Blue Mound Quarry reclaimed limestone mine, Livingston County.



AA Quarry, Limestone Mine, Johnson County - recently opened.

Enforcement

Enforcement powers of the Missouri Mining Commission were enhanced in two significant ways by revisions made in 1990 to The Land Reclamation Act. The commission may impose administrative penalties when notices of violation are issued and they have the option to refer civil actions to the Cole County Court or in the county in which the violation occurred. These revisions have resulted in more prompt and vigorous action by the operators to eliminate violations. Often, violations observed during an inspection are eliminated through the use of conference, conciliation and persuasion. This process encourages the operator to correct a noncompliance through voluntary action and is used normally in cases of relatively minor noncompliance. If attempts to correct a violation through conference, conciliation and persuasion are not successful, a notice of violation is issued to the operator.

Ten notices of violation were issued during 2014 and 2015. Six violations were administrative in nature, four violations involved performance standard requirements. Administrative violations often involve mining without a valid permit, failure to maintain bond or failure to renew a permit. The performance standard violations involved mining below the waterline and mining into the permanent bank at gravel mine sites and failure

to control erosion at a clay pit. An increase in the number of site inspections at industrial minerals operations typically carries the potential for an increase in enforcement activity during a specific time frame. Since the Land Reclamation Program started conducting environmental assistance visits, the department has noticed mining operators are now more informed about the law and regulations and are less likely to be in a violation situation. Potential enforcement actions are avoided or minimized through close coordination with Land Reclamation Program staff.



Sediment control overwhelmed, Callaway County.

Bonding

Open-pit sand and gravel operations mining 5,000 tons or less per year are bonded at a rate of \$500 per acre before a permit is issued. For all other operations, the minimum bond required on eight acres or less is \$8,000 and \$500 for every acre permitted thereafter. The rules allow for a \$4,500 per acre topsoil bond when there is a failure to salvage topsoil for those acres. Typically, in-stream sites are not subject to bonding requirements due to the lack of reclamation responsibility. However, upon inspection, if an in-stream site is determined to have created a reclamation responsibility, bonding requirements of \$500 per acre will be imposed.

The state will use the bond to complete reclamation if the permittee, for whatever reason, is unable or unwilling to fulfill the legal obligation to reclaim the disturbance to the land surface they caused. An operator may secure bond through a surety bond, certificate of deposit, or an irrevocable letter of credit. All bonds must be submitted on forms provided by the Land Reclamation Program.

If an operator elects to use a certificate of deposit to secure bond, the certificate of deposit must be

accompanied by a "Personal Bond Secured by a Certificate of Deposit" form. The certificate of deposit must also be assigned to the state of Missouri and the issuing bank must acknowledge this action using an Assignment of Certificate of Deposit. The assignment must be irrevocable and conditioned on the release of the bond by the Missouri Mining Commission. The interest earned on a certificate of deposit must be made payable to the depositor.

Applicants who wish to increase the number of acres under permit must post additional bond. A surety bond may be increased through a rider with an attached power of attorney. Bonds may be replaced, dollar for dollar, at any time. The old bond cannot be returned until the replacement bond has been submitted and accepted by the Land Reclamation Program staff director. At the end of 2015, there is record of:

\$ 21,823,350.00	Surety Bonds
\$ 3,192,636.97	Certificates of Deposit
\$ 5,552,768.00	Letters of Credit
\$ 30,568,754.97	Total Amount in Bond

Bond Forfeiture

The Land Reclamation Act went into effect Jan. 1, 1972, and it permitted and regulated the mining of limestone, clay, barite, tar sands, sand and gravel in Missouri. As part of regulation, the companies and individuals participating were obligated to put up a reclamation performance bond in the amount of \$500 per acre for every permitted acre. If an individual or company fails to perform the required reclamation, the bonds would then be forfeited and the state would complete the reclamation. An operator who forfeits the bond may not be issued another permit to engage in surface mining from the Missouri Mining Commission in accordance with 444.778.2 RSMo.

The bonding amount was subsequently found to be inadequate to cover reclamation costs, and there were additional inadequacies in the act. Therefore, the act was amended effective Aug. 28, 1990. The amendment added granite, traprock, sandstone, oil shale and shale to those already regulated, and it increased the reclamation bonding to a minimum bond of \$8,000 for the first eight acres and \$500 for every acre permitted thereafter. Between 1972 and 1990, 26 sites operated by 14 different companies became bond forfeiture sites and proper reclamation became the responsibility of the department's Land Reclamation Program.

In 2003, National Refractories left reclamation responsibilities to the state when they went bankrupt.

Due to negotiations with the surety company, a settlement was not reached until October 2006. The surety provided \$85,250 in bond monies to reclaim 25 clay pits for a total of 162.5 acres. After an initial inspection, the Land Reclamation Program quickly learned there was not enough bond money to properly reclaim the sites in accordance with The Land Reclamation Act. Two sites in particular have a cost estimate of \$200,000 for proper reclamation. The program continues to work with landowners to reclaim these sites. No mining companies left a reclamation responsibility to the state in 2006 or 2007. In 2008 and 2009, a total of 93-acres were forfeited involving two limestone and two sand and gravel mining operations. In 2010 and 2011, no bonds were forfeited. In 2012 and 2013, two clay mine sites for a total of 43 acres were forfeited along with an eight-acre limestone site. In 2014 and 2015, forfeiture of the White Rock Quarry in Lincoln County, consisting of 41 bonded acres, took place.



White Rock Quarry, Lincoln County.

In-Stream Sand and Gravel Mining

In-stream sand and gravel mining is one of the most prevalent types of mining in Missouri, as far as the number of sites. This type of mining method does not allow excavating machinery in the flowing portion of the stream. It is a bar skimming mining operation.

Bar skimming is limited to the exposed portion of the gravel bar above the water line, between the ordinary high banks of a stream. Bar skimming is recommended as a means for advancing stream resource conservation while maintaining a viable extraction industry. This type of gravel removal operation lowers the risk of forward erosion of the stream channel upstream and sedimentation downstream. In addition, the practice of removing gravel at periods of low water flow will aid in protecting wildlife near the stream environment. Some of the new rules include, staying an adequate distance from the stream bank, use of existing crossing areas, leaving an undisturbed buffer of 10 feet from the flowing water line and no mining below the water line unless the operator has applied for and received a variance.

In 2015, the program permitted 261 in-stream sites. Numerous operators across the state excavate sand and gravel deposits, commonly known as gravel bars, as a source of aggregate material.

During the 1990s, in-stream sand and gravel mining underwent several changes in regulatory

control within Missouri. In the early 1990s, the Land Reclamation Program was the permitting and enforcement authority that both issued permits for this type of mining activity, and oversaw the proper removal of sand and gravel from Missouri's streams. In the mid-1990s, the regulation of this activity was taken up by the U.S. Army Corps of Engineers (USACE) who took over the entire process of permitting and inspecting these mining facilities. USACE lost jurisdiction over this activity in late 1998 due to a ruling by the U.S. District Court of Appeals. The court found that "de minimus" or incidental fall back of sand and gravel into the stream from which it was being excavated did not constitute the placement of fill by the mining operation. Hence, the court ruled the USACE had exceeded its authority in requiring a permit for this activity.

In January 1999, the Land Reclamation Program resumed the former position of the regulatory authority over this type of mining activity and bases this authority upon the provision of the state's Land Reclamation Act. Approximately 150 permits were reissued to the mining industry during the early months of 1999 by the Land Reclamation Program to take the place of the existing USACE permits. This responsibility continues to the present day on the part of the Land Reclamation Program.



Spring Creek Materials, Inc., Big Creek, Shannon County.

Spotlight on the Ozarks: Sand and Gravel Mining

Sand and gravel mining operators in the Ozarks face challenges that operators in other regions of Missouri do not experience. The greatest regulatory challenge for sand and gravel operators is conducting mining and processing operations within the watershed of Outstanding National Resource Waters or Outstanding State Resource Waters. Outstanding resource waters are defined by the department's Water Protection Program as state or national waters:

- Outstanding state resource waters are high quality waters with a significant aesthetic, recreational or scientific value, specifically designated as such by the Clean Water Commission.
- Outstanding national resource waters are waters that have outstanding national recreational and ecological significance. These waters shall receive special protection against any degradation in quality. Congressionally designated rivers, including those in the Ozark National Scenic Riverway, are included as it would be reflected in construction costs. Currently, adequate supplies of sand and gravel exist to meet growth demands in the watersheds

within the Outstanding State Resource Waters in the Ozarks, as this region is not experiencing the economic growth demands when compared to Branson, St. Louis or Kansas City.

Mining and economic development projects in the watersheds within the Outstanding State Resource Waters are subject to either no discharge requirements or shall not cause the current water quality in the streams to be lowered. These mine sites or development projects are no different than others. However, the water protection standards have stricter requirements compared to other portions of the state. Operators in the Ozarks want universal and fair treatment for all mine operators in the state. Operators inform the department to keep in mind the impacts the water quality standards have on economic development as these decisions affect day to day operations. Ozark operators are managing their business on a thin line and believe extra conditions imposed on their operation are unfair circumstances. There are a number of websites that provides free aerial photographs, allowing operators to locate isolated gravel bars.

METALLIC MINERALS

Introduction and Purpose

The Metallic Minerals Waste Management Act, enacted into law in 1989, gives regulatory authority to the department's director to have and exercise all powers provided in sections 444.352 – 444.380 of this act. The Metallic Minerals Waste Management Act regulates disposal of waste from metallic minerals mining, beneficiation and processing. Some of the director's duties are to secure appropriate staff, coordinate existing environmental programs, issue permits, conduct inspections, manage fees, maintain records of management practices, seek additional funds, publish rules and pursue appropriate enforcement actions. The minerals covered by the Metallic Minerals Waste Management Act are those minerals or ores containing lead, iron, zinc, copper, gold and silver. After Aug. 28, 1989, active metallic minerals waste management areas operating



Fletcher tailings dam being armored with rock.

under a National Pollutant Discharge Elimination System permit, or dam safety registration, or both, were required to submit a Metallic Minerals Waste Management Permit within six months, or within 90 days after filing an application for a National Pollutant Discharge Elimination System construction permit or dam safety construction permit, whichever is applied for first. The operator applied to the director for a metallic minerals waste management area permit. Today, operator applications contain but are not limited to a schedule and plan for closure and inspection-maintenance of the waste management area. Operators will implement the plan when the useful operating life of the waste management area is complete or when there is permanent cessation of the operation.



New Viburnum Clay Cap starting to grow vegetation, October 2015.



New Viburnum tailings dam out slope armored with rock.

Permitting

In 1991, the department issued 11 permits to operators under The Metallic Minerals Waste Management Act. During 2001 and 2002, the Land Reclamation Program continued the five-year review of the metallic minerals waste management permits. In 2002, the only underground iron ore producer, the Pea Ridge Iron Ore Company transferred their 180 acre permit area to an entity by the name of Upland Wings, Inc. Upland Wings was bought out by Pea Ridge Resources in 2011. Pea Ridge Resources is conducting studies to determine if mining will resume. The tailings at Pea Ridge are also being studied for recovery of magnetite and rare earth elements.

Metallic Minerals Waste Management permit applications consist of financial assurance information and detailed waste management area closure and inspection-maintenance plans. The plans establish and explain the technical steps proposed to accomplish and maintain closure after mining and waste disposal is completed. Issues addressed in the plans include the following:

- The design and construction of waste control structures and tailings dams.
- The characterization of waste products.
- The methods for control and protection of surface water.
- The methods for protection of ground water and aquifers.
- The geology and seismicity of the area.
- The potential of subsidence.
- The reuse and off-site removal of wastes.
- The surface reclamation of waste management areas.

During the ongoing permit application review and five year review of the closure and inspection maintenance plans, Land Reclamation Program staff coordinates permitting with the other programs within the department involved with the metallic minerals waste management areas. They include Missouri Geological Survey's Geological Survey Program and Environmental Quality Division's Air Pollution Control Program, Solid Waste Management Program, Hazardous Waste Program, and the Water Protection Program. This coordination process affords other program staff to review and comment on the technical aspects of the plans so that all of the department's issues may be incorporated into the permit.

The Doe Run Company's Buick Resource Recycling Division is being operated under a Hazardous Waste Program landfill permit. This landfill site

encompasses the current metallic mineral waste management area permitted by the Land Reclamation Program. The Hazardous Waste Program's permit is more restrictive and requires a much more significant clay cap over the old slag pile. This would mean much better environmental protection; due in part to the fact the site must meet post closure requirements for 30 years after closure date.



Pea Ridge Tailings, Washington County.



The Doe Run Company Buick Recycling, Iron County.



Herculaneum slag pile about capped with soil June 2012.

Waste Management Act

During this reporting period, The Doe Run Company has been updating the five year closure and inspection maintenance plans for the following mines: Buick, Fletcher and West Fork.

The Fletcher Mine five-year review is complete.

The West Fork mine is currently permitted by ASARCO and the five year review also involves a

proper transfer from ASARCO to Doe Run and should be completed by the end of 2016.

A response from The Doe Run Company is on hold for the Buick mine until all issues are resolved from West Fork, so the same comments are not repeated. The Buick mine review is expected to be completed by mid-2017.

Inspections

Typically, inspections are performed semi-annually on the 11 metallic minerals waste management permit areas within Missouri. During the course of these inspections, all aspects of each company's permits are evaluated. The main focus of these inspections is to assess the company's compliance with virtually every environmental law that is administered by the department. The Land Reclamation Program is entrusted as the coordinating agency within the department for each active metallic mineral producer currently operating in Missouri. It is the program's responsibility to act as the liaison for the other programs within the department and each metal producer to ensure continuing compliance with all applicable state environmental laws.

Actual on-the-ground reclamation does not begin at these sites until mineral production is stopped,

and mine closure begins. Only one lead producer in Missouri is in active closure at the present time. Teck-Cominco Magmont Mine ceased production in 1995 and began the actual reclamation of the surface effects of nearly 30 years of lead mining and processing.

During 2001 and 2002, three more facilities ceased production. The Doe Run Company's Viburnum mine and Buick primary smelter also ceased production. The Doe Run Company's Glover smelter has received approval from the department for closure of the Doe Run slag pile and the ASARCO Slag Pile. The closure and inspection-maintenance plans for these mines and smelters are either being reviewed by the department at this time or the department is waiting for submittal of revised closure plans for review and approval.



Teck American Incorporated, Magmont Mine 2014.



Grading work beginning on the ASARCO Glover Slag Pile, Iron County.

Enforcement

To date, four enforcement actions under the provisions of the MMWMA have been necessary by the Land Reclamation Program. Enforcement actions were at two smelters and two mines. These actions included violations for construction of a waste management control structure prior to department approval, the failure of two facilities to contain metallic mineral wastes within their approved waste management areas and the failure of a now bankrupt facility for failure to submit annual permit fees.

Enforcement under this law is significantly different from enforcement under either the coal or industrial minerals units of the program. When it becomes necessary to issue a citation to any of the

metal producers, the authority to do so rests solely with the director of the department. Enforcement is only authorized by law after attempts to eliminate the violation through conference, conciliation and persuasion have been exercised and exhausted. In 2010 and 2011 the department and Attorney General's legal staff worked with Doe Run in negotiation settlement concerning The Doe Run Company's Sweetwater Mine. These negotiations produced an enhanced environmental protection plan that goes above the requirements in the Metallic Minerals Waste Management Act. The outcome of those environmental protection plans and on the ground improvement is documented as a noteworthy event for this biennial report.



Sweetwater Tailings impoundment standing on the dam to the impoundment, Reynolds County, October 2015.

Bonding

Under The Metallic Minerals Waste Management Act, Section 444.368, before a permit can be issued, the operator shall file a demonstration of financial assurance in the form of a bond, certificate of deposit, letter of credit, insurance, company guarantee, escrow agreement or other form of financial assurance as approved by the director. Any financial assurance instrument shall be in such form as the director prescribes, to the benefit of the state of Missouri, conditioned that the operator shall faithfully perform all terms of the permit and the requirements of sections 444.352 to 444.380. Upon completion of the terms of the permit and closure and inspection-maintenance requirements in sections 444.352 to 444.380, the financial assurance instrument may then be released from the benefit of the state of Missouri, back to the operator.

The financial assurance instrument shall be signed by the operator and shall be in the penal sum of \$1,000 for each acre or fraction of an acre of the metallic minerals waste management area, but not less than \$20,000 for each permit. No financial assurance instrument shall be cancelled or terminated by the operator except after no less than 90 days' notice and substitution by some other financial assurance approved by the director. In the event a company guarantee is furnished, it shall be in the form of a letter, duly executed by an officer of the company, guaranteeing the required amount of financial assurance, accompanied by a financial test statement demonstrating ownership of real property or mining rights in Missouri of an assessed valuation of at least three times the amount of required financial assurance.

INFORMATION ON THE INTERNET

Missouri Department of Natural Resources

Department Home Page dnr.mo.gov
Land Reclamation Program dnr.mo.gov/geology/lrp/mineralsandmining.htm
Land Reclamation Program Forms dnr.mo.gov/forms/#landreclamation
The Complete Missouri Mining Law moga.mo.gov/mostatutes/ChaptersIndex/chaptIndex444.html
Code of State Regulations (see Division 40) sos.mo.gov/adrules/csr/current/10csr/10csr

U.S. Department of the Interior, Office of Surface Mining

Office of Surface Mining, Washington D.C. osmre.gov
Office of Surface Mining, Mid-Continent Regional Coordinating Center, Alton, Ill. mcrcc.osmre.gov

Other Mining and Reclamation Organizations

National Association of Abandoned Mine Land Programs naamlp.net
Interstate Mining Compact Commission imcc.isa.us
National Association of State Land Reclamationists naslr.org
Missouri Limestone Producers Association molimestone.com
The Mining Industry Council of Missouri momic.com



Christy Minerals, Johnson Clay Pit Reclaimed.